BONNEVILLE POWER ADMINISTRATION
FISH AND WILDLIFE PROGRAM FY99 PROPOSAL FORM

Section 1. General administrative information

Columbia River Basin Fish Key

Bonneville project number, if an ongoing project 9125

Business name of agency, institution or organization requesting funding
Eastern Washington University Biology Department
Business acronym (if appropriate) EWU

Proposal contact person
Name Allan T. Scholz, Ph.D.
Mailing Address EWU Biology Department, MS#72
City, St Zip Cheney, WA 99004
Phone (509) 359-6397 or 7498
Fax (509) 359-7400
Email address NA

Subcontractors.

Organization	Mailing Address	City, ST Zip	Contact Name
Joseph R. Tomelleri (Freelance illustrator)	2219 Washington Blvd.	Kansas City, KS 66102	Joseph R. Tomelleri

NPPC Program Measure Number(s) which this project addresses.

The proposed project is not directly related to the Columbia Basin Fish and Wildlife Program (FWP) in the sense that the FWP is a series of coordinated measures that, when implemented, are intended to restore and enhance dwindling stocks of anadromous salmon and resident fish in the Columbia River Basin. In contrast, this project is not intended to restore or enhance fish but instead summarize and integrate existing information about them, including data collected as part of the FWP. This regional synthesis would help to inform future activities conducted under the FWP.

NMFS Biological Opinion Number(s) which this project addresses.

NA No direct relationship

Other planning document references.

NA

Subbasin.

NA Existing data will be collected for all sub-basins.

Short Description.

Write book about taxonomy and life histories of fishes inhabiting the Columbia River System

Section 2. Key words

Mark	Programmatic Categories	Mark	Activities	Mark	Project Types
X	Anadromous fish		Construction		Watershed
X	Resident fish		O & M		Biodiversity/genetics
	Wildlife		Production		Population dynamics
	Oceans/estuaries		Research		Ecosystems
	Climate		Monitoring/eval.		Flow/survival
	Other		Resource mgmt		Fish disease
			Planning/admin.		Supplementation
			Enforcement		Wildlife habitat en-
			Acquisitions		hancement/restoration

Other keywords.
NA

Section 3. Relationships to other Bonneville Projects
NA

Section 4. Objectives, tasks and schedules

Objectives and tasks

Obj 1,2,3	Objective	Task a b c	Task
1	Collect fish taxonomy and life history data for the Columbia River System	a	Review scientific journals for primary papers and review articles about Columbia River System fish.

Obj 1,2,3	Objective	Task a b c	Task
1	(continued)	b	Review fisheries abstracts for articles about Columbia River System fish.
		c	Search stacks, government documents, archives and species collections at libraries in the region for books, reports and other documents pertaining to Columbia River salmon. This will initially be accomplished through interlibrary loan and Internet.
		d	Make three or four auto trips each to **WA,** OR, **ID,** MT and BC to **visit** main and regional offices of federal, state and tribal fisheries agencies, federal hydroproject operator/regulator agencies, land management **agencies,** water quality agencies, universities, historical societies, libraries and other groups with interest in Columbia River fisheries. One purpose of these trips is to collect unpublished gray literature, creel or fishery survey data in agency files but not in reports. A second purpose is to take photographs of and collect old photographs for use in the book. A third purpose is to conduct physical search of libraries. A fourth purpose is to view fish collections to collect data for the fish key.
		e	Make two orthree airtrips each to WA, ID, OR, MT and Washington **D.C.** to collect data. Purposes are same as Task **id** (above). The purpose of the Washington D.C. trip is to examine the Smithsonian Fish Collection for constructing the fish key and to examine archival records of the U.S. Fish Commission, particularly their fish stocking records to obtain information about introduction of exotic fishes to the Columbia River Basin.
2	Develop life history accounts for individual species and compare between sub-**basins.**	a	Compile taxonomy data to describe etymology and history of scientific name. Also describe common name(s) and Indian names.
		b	Compile data on distribution in the Columbia Basin. Construct distribution maps that indicates relative abundance in each sub-basin.
		c	Compile data on stocks, including information about native and hatchery stocks, introductions and genetic stock identification.

Obj 1,2,3	Objective	Task a b c	Task
2	(continued)	d	Compile data about fish feeding habits, including feeding habits at different life stages and regional differences in feeding habits related to type of sub-basin environment. Describe predator-prey interactions.
		e	Compile data on age and growth, including comparisons of growth in different regions and trends in the growth over time.
		f	Compile data on reproduction such as age at first spawning by males and females frequency of spawning, length or weight/fecundity relationships, spawning seasons, peak of spawning season and secondary sexual characteristics.
		g	Compile data on population dynamics, including population abundance, relative abundance, mortality rates, recruitment and production potential. Note differences between regions and trends over time.
		h	Compile data on utilization, including sport, commercial or subsistence harvest and relation to man.
		i	Compile data on daily, seasonal and annual behavior pattems, and habitat preferences to develop a life history account. Prepare draft life history diagrams. Also, describe relationship to other organisms and ecological niche in the ecosystem.
		j	Compile data about the management history in the Columbia Basin and describe current management programs.
		k	Compile data on parasite, viral and bacterial diseases that affect this species. Describe past and current status.
3	Describe the ecosystems of the Columbia Basin in which these species live and provide comparisons between sub-basins.	a	Compile data on nutrients primary and secondary productivity.
		b	Compile data on mining, industrial and municipal pollutants.
		c	Compile data on watershed activities such as logging, irrigation, agriculture and grazing; including pesticide and herbicide pollution, erosion and sedimentation of rivers, and alteration to physical habitat.
		d	Compile data on physical habitat changes related to water flow and habitat inundation caused by construction and operation of hydroelectric dams.

Obj 1,2,3	Objective	Task a b c	Task
3	(continued)	e	Compile data on how commercial, sport and subsistence fisheries have impacted populations.
		f	Compile data on how natural cycles, e.g., El Nino events, have impacted populations. e.g., Describe how fish are redistributed in the system during high flow years.
4	Construct taxonomic key to fishes of the Columbia River Basin.	a	Construct taxonomic key using data collected from Jish collections housed at museums in Task id and le. Additionally, other fish keys will be consufted.
		b	Send key to taxonomy expert for peer review
		c	Incorporate comments of the reviewer to prepare final version of key.
5	Prepare figures for book.	a	Contract J.R. Tomelleri to produce color plates of fish for the key.
		b	Prepare other figures for the text, such as distribution maps and life history diagrams, in-house using the EWU Instruction Media Center Graphics Laboratory.
6	Write and publish book.	a	Prepare tables and graphs that will be used in the text.
		b	Write book. At the onset, prospective publishers will be contacted and a contract developed.
		c	Integrate figures, tables, graphs and distribution maps into text using Desktop Publishing software.
		d	Edit and proof draft.
		e	Send draft book to federal, state and tribal fish and wildlife agencies for peer review.
		f	Incorporate comments and prepare publisher ready fair copy of book.
		g	Print book.

Objective schedules and costs

Objective #	**Start Date mm/yyyy**	**End Date mm/yyyy**	**cost %**
1	10/1998	12/2000	21.5
2	01/1999	03/2001	21.4
3	01/1999	03/2001	21.4
4	12/1999	09/2000	11.2
5	10/1998	09/2001	13.5
6	03/2000	09/2001	11.0
			TOTAL 100.00%

Schedule constraints.

Final publication may be delayed beyond the end of the third year, depending upon the book publisher's schedule. However, all other work will be completed by the end of the third year.

Completion Date: 2001

Section 5. Budget

FY99 budget by line item

Item	Note	FY 99
Personnel		55,350.00
Fringe benefits		14,368.00
Supplies, materials, non-expendable property	Capital equipment Supplies Communication	8,382.00 3,850.00 6,000.00
Operations & maintenance		
Capital acquisitions or improvements *(e.g.,* land, buildings, major equip.)	NA	
PlTtags	NA	
Travel		12,982.00
Indirect costs	27% of salaries	14,945.00
Subcontracts		14,500.00
Other		
TOTAL		$133,376.00

*See detailed explanation of budget and justification in attached proposal. Budget numbers rounded to nearest whole dollar.

Section 6. Abstract

The objective of this proposal is to write a book about the taxonomy and life histories of fishes in the Columbia River System. The book will synthesize historical and current fisheries and limnological data for all regions within the Columbia River System. lt will provide regional and temporal comparisons of biogeographic distribution and~productivity of native and introduced fish, as well as life history and taxonomy information typically found in a fish key. The book will also inform fish and water managers who make decisions concerning system operations about the economic value and ecological importance of fisheries in different parts of the basin. The project will require three years to complete (October 98 to September 01).

Section 7. Project description

a. Technical andlor scientific background.

See attached proposal.

b. Proposal objectives.

See attached proposal.

c. Rationale and significance to Regional Programs.

See attached proposal.

d. Project history.

Not applicable.

e. Methods.

See attached proposal.

f. Facilities and equipment.

See attached proposal.

g. References.

See attached proposal.

Section 8 . Relationships to other projects.

Not applicable.

Section 9. Key personnel.

A. Scholz (See attached abbreviated curriculum vitae)

- BS, MS, Ph.D. in Zoology, University of Wisconsin -- Madison.

- Professor of Biology (Fisheries) at Eastern Washington University. Teach courses in Ichthyology, Fisheries Management, and Columbia River Fisheries.

- Experience compiling historical fisheries data, *e.g.*, see A. T. Scholz + 9 authors (1985) Compilation of information on salmon and steelhead total run size, catch and hydropower related losses in the Upper Columbia River Basin above Grand Coulee Dam. Upper Columbia United Tribes Fisheries Center,

Department of Biology, Eastern Washington University Technical Report No.2:
165 pp.

- Published 112 papers, books and technical reports. Administered 92 grants and contracts, most related to fisheries in the Columbia River Basin.

- Wrote grant in 1996 for the computer and software that would be used for this proposed project. I'm familiar with software required because I have used it to prepare lectures for courses that I teach. I've also taken short courses in use of this scanning and desktop publishing software. All the lectures for my Introductory course are computerized.

J. Miller:

BS in Biology from Eastern Washington University. Research Associate at Eastern Washington University.

- Experience collecting information from libraries, government documents and archives.

- Haye assisted in fisheries investigations from 1994 to present and co-authored five technical reports.

- Experience managing large data files, typing, filing, record/bookkeeping, data entry and retrieval, making charts and graphs.

J.R. Tomelleri (illustrator):

MS in Biology Hays State University, Kansas.

Freelance illustrator.

Senior author of fish key for *Fishes of the Central United States.*

Illustrator for several recently published fish keys.

ABBREVIATED CURRICULUM VITAE

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Allan T. Scholz

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16 January 1948

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United States

RESEARCH AND TEACHING

Date:	Job Description	Location	Courses Taugl
1980-84	Assistant Professor	Eastern Washington University	Ichthyology

1985-89	Associate Professor	Department of Biology	Fisheries Manage Fish Physiology
1989-98	Professor		Columbia River Fisheries Fisheries Field Techniques Aquatic Ecology
Summer, 1983, 1984	Visiting Professor	Shannon Point Marine Laboratory Western Washington University	Marine Ichthyol

MEMBERSHIPS ON REGIONAL COMMITTEES:

1987-1995 **Member,** Columbia Basin Fish and Wildlife Authority, Resident Fish **Committee.** (Chairman **1987-1989).**

1985-1987 Member, Northwest Power Planning Council, Resident Fish Advisory Committee.

MEMBERSHIP IN PROFESSIONAL SOCIETIES:

American Fisheries Society (LIFE MEMBER)

PUBLICATIONS:

1976 **Scholz,** A.T., R.M. Horrall, **J.C.** Cooper and A.D. Hasler. Imprinting to chemical cues: The basis for homestream selection by **salmon.** *Science* 196: 1247-1249.

1983 Hasler, A.D. and **A.T.** Scholz. *Olfactory Imprinting and Homing in Salmon.* Zoophysiology, Vol.14. **Springer-Verlag,** Berlin, Heidelberg, New York, Tokyo. 134 pp.

1985 Scholz, A.T., **R.J.** White, **M.** Muzi, and T. Smith. Uptake of radio-labeled truodothyronine in the brain of steelhead trout *(Salmo gairdneri)* during parr-smolt transformation: Implications for the mechanism of thyroid activation of olfactory imprinting. *Aquaculture* 45: **199-214.**

1993 Geist, D.R., T. Scholz and R.A. Soltero. Relationship between Phytoplankton volume and rainbow trout - *Daphnia pulex* interactions after phosphorus inactivation, Medical Lake, Washington. *Journal of Freshwater Ecology* 8 (4): 341 - 353.

1995 Modde, T., AT. Scholz, **J.** Williamson, G.B. Haines, B.D. Burdick and F.k. Pfeifer. 1995. An augmentation plan for razorback sucker in the upper Colorado River Basin. American Fisheries Society Symposium 15:102-111.

Submitted Tilson, M.B., A.T. Scholz, and R.J. White. Parr-smolt transformation in kokanee salmon. Submitted to *Transactions of American Fisheries Society.*

Section 10. Information/technology transfer

The proposed project will result in the publication of a Columbia River System fish and life history book. Additionally, material photocopied during the course of this project will be archived and stored in the Eastern Washington University Library Special Collections, where it could be accessed by the public.